

**REMARKS****Status of Claims:**

Claims 1-34 are pending in the application. Each claim defines an invention that is novel and unobvious over the cited art. Favorable consideration of this case is respectfully requested.

**Disclosure Supporting the Instant Amendment:**

Claims 1 and 23 are amended to recite: "said solid layer." Support for this recitation was present in the original disclosure at, for example, page 4, lines 22-24 and 28; and page 5, lines 1-2.

**Rejection Under 35 U.S.C. § 102(b):**

Claims 1-34 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kroll (5,451,295).

Rejection under 35 U.S.C. § 102 requires the prior art disclose each and every limitation of the claimed invention (MPEP § 706.02). In determining anticipation, no claim limitation may be ignored. See *Pac-Tex, Inc. v. Amerace Corp.*, 14 USPQ2d 1871 (Fed. Cir. 1990). Anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. See *Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir 1985), *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir 1986), and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir 1986). There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. § 102. See *Scripps Clinic and Research Foundation v. Genentech, Inc.*, 18 USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984). The evidentiary record fails to teach each limitation of the present

invention in view of the silence of Kroll regarding separating a solid layer containing contaminants from a substrate and the application of sonic energy.

Claims 1 and 23 are amended to more clearly point out that a layer of water is applied to a surface of a substrate to loosen contaminants thereon. The layer of water is then frozen, trapping the contaminants. Energy is applied separating the "frozen fluid" from the substrate. (Page 4, line 28). However not enough energy is applied to cause re-melting of the fluid. (Page 5, lines 1-2). In contrast, Kroll does not teach the removal of a solid layer. Kroll applies and freezes a layer of water, but then liquefies the water. Kroll teaches any method of heating works well, "so long as the solidified medium is substantially liquefied and/or evaporated." (Column 3, lines 66-68). Moreover, as the Examiner acknowledges, Kroll is silent as to sonic energy. (Examiner's Point 11).

Claims 1-8, 10-12, and 19 were rejected under 35 U.S.C. § 102(b) as being anticipated by Sakai (5,857,474). The evidentiary record fails to teach each limitation of the present invention in view of the silence of Sakai regarding forming a solid layer containing contaminants from a substrate and the silence of Sakai regarding the application of sonic energy.

The present invention forms a solid layer of ice on the surface of a substrate having contaminants thereon. In contrast to forming a solid layer, Sakai forms pieces of ice around individual contaminant particles as condensation nuclei. (Figure 2; column 1, lines 64-5; column 4, lines 28-30). Moreover, Sakai does not teach removing the ice with sonic energy. Rather Sakai blows the ice with high-pressure gas.

**Rejection Under 35 U.S.C. § 103(a):**

Claims 14-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kroll in view of Collier (5,724,186). Claims 23-33 were similarly rejected over the same combination of citations.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*. All words in a

claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*. (MPEP § 2143.03). When evaluating the scope of a claim, every limitation in the claim must be considered. See e.g. *In re Ochiai*. (MPEP § 2144.08). The evidentiary record fails to teach each limitation of the present invention. Specifically, the references taken as a whole or severally fail to teach removal of a solid layer.

As discussed above, in addition to being silent as to sonic energy, Kroll fails to meet the teachings of the present invention by requiring the liquefaction (or evaporation) of the solid layer of ice formed on the substrate. Collier does not complete the teaching of Kroll so as to reach the present invention because Collier is inoperable with Kroll. Kroll forms a solid layer of ice on a substrate, following which, the layer is liquefied. Collier prevents the formation of a solid layer of ice by impinging on a mirror surface a continuous stream of sonic energy. The sonic energy causes droplets of water to coalesce and fall from the surface by gravity. Alternatively, the water droplets are atomized to vapor. (Column 2, lines 2-10). Where the particles are ice, the vibrations cause the particles to fall from the surface. (Abstract).

Where the Examiner proposes a combination that makes a prior art reference inoperable for its intended purpose, the resulting inoperable prior art reference is considered to teach away from the proposed combination, thereby supporting a showing of nonobviousness. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (Finding no suggestion to modify a prior art device where the modification would make the device inoperable for its intended purpose); *TecAir, Inc. v. Denso Mfg. Michigan Inc.*, 192 F.3d 1353, 52 USPQ 2d 1294, 1298 (Fed. Cir. 1999) (Holding that because the combination was inoperable for its intended purpose, a jury could reasonably find the patent taught away from the combination); *In re Spinnoble*, 405 F.2d 578, 587 (CCPA 1969) (holding if where combined, the references would produce a seemingly inoperative device, the references teach away from their combination).

Claims 13 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kroll in view of Collier as above, and further in view of Williams (4,491,484).

Williams merely teaches the equivalence of cryogenic carbon dioxide and cryogenic liquid nitrogen as cooling media. Williams fails to teach removal of a solid layer of ice. Moreover, as demonstrated above, Collier and Kroll are not properly combinable. Williams does not address this lack.

Claims 23-33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakai and Collier. As discussed above, Sakai does not form a solid layer. Rather, Sakai forms individual ice particles around contaminants as condensation nuclei. (Figure 2). Collier is not properly combinable with Sakai, because, as discussed above in connection with Kroll, Collier teaches a method for the prevention of forming a solid layer on a surface.

Claim 34 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakai in view of Collier as above, and further in view of Williams. As discussed above, Collier is not properly combinable with Sakai. Williams does not complete the teaching because Williams merely teaches cryogenic liquids.

**Conclusion:**

In view of the above, consideration and allowance are, therefore, respectfully solicited.

Accordingly, it is respectfully requested that the foregoing amendments be entered, that the application as so amended receive an examination on the merits, and that the claims as now presented receive an early allowance.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Commissioner is hereby authorized to charge any fees or credit any overpayment associated with this communication, including any extension fees or fees for the net addition of claims, to Deposit Account No. 22-0185.

Respectfully submitted,



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